

CLAIMS

1. A moving image coding apparatus which codes time-series frames constituting moving image data, characterized by comprising:

5 decomposition means for decomposing a frame into a plurality of subbands having different frequency components;

 first extraction means for classifying the plurality of subbands into a first group and a second
10 group and extracting, as motion compensation target data, data of a predetermined number of upper bits of frequency component coefficient data forming subbands belonging to the first group;

 second extraction means for extracting data of a
15 predetermined number of lower bits of each of frequency component coefficient data forming subbands belonging to the first group;

 motion compensation means for generating motion vector information and predicted value information on
20 the basis of motion compensation target data of a current frame extracted by said first extraction means and decoded data corresponding to motion compensation target data obtained when a preceding frame is coded;

 first coding means for obtaining a difference
25 value between predicted value information generated by said motion compensation means and motion compensation target data of the current frame and coding the

difference value and the motion vector information;

second coding means for coding, as non-motion compensation target data, data of a predetermined number of lower bits of each frequency component

5 coefficient data extracted by said second extraction means and frequency component coefficient data of subbands belonging to the second group; and

multiplexing means for multiplexing the code data obtained by said first coding means and said second
10 coding means.

2. The apparatus according to claim 1, characterized in that

said decomposition means decomposes a frame into a plurality of subbands on the basis of a discrete
15 wavelet transformation method,

the first group comprises subbands of low-frequency components including a subband LL, and

the second group comprises subbands of frequency components higher in frequency than the low-frequency
20 components.

3. The apparatus according to claim 1 or 2, characterized in that said second coding means performs coding for each bitplane at each bit position which represents frequency component data or for each
25 sub-bitplane.

4. The apparatus according to claim 3, characterized in that said second coding means includes selection

means for selecting bits in order of a least significant bit to an upper bit as bitplanes serving as non-coding targets, on the basis of a generated code amount, and codes bitplanes other than the bitplanes
5 selected by the selection means.

5. A control method for a moving image coding apparatus which codes time-series frames constituting moving image data, characterized by comprising:

a decomposition step of decomposing a frame into
10 a plurality of subbands having different frequency components;

a first extraction step of classifying the plurality of subbands into a first group and a second group and extracting, as motion compensation target
15 data, data of a predetermined number of upper bits of frequency component coefficient data forming subbands belonging to the first group;

a second extraction step of extracting data of a predetermined number of lower bits of each of frequency
20 component coefficient data forming subbands belonging to the first group;

a motion compensation step of generating motion vector information and predicted value information on the basis of motion compensation target data of a
25 current frame extracted in the first extraction step and decoded data corresponding to motion compensation target data obtained when a preceding frame is coded;

a first coding step of obtaining a difference value between predicted value information generated in the motion compensation step and motion compensation target data of the current frame and coding the
5 difference value and the motion vector information;

a second coding step of coding, as non-motion compensation target data, data of a predetermined number of lower bits of each frequency component coefficient data extracted in the second extraction
10 step and frequency component coefficient data of subbands belonging to the second group; and

a multiplexing step of multiplexing the code data obtained in the first coding step and the second coding step.

15 6. A computer program which is read and executed by a computer to function as a moving image coding apparatus which codes time-series frames constituting moving image data, characterized in that the computer program functions as:

20 decomposition means for decomposing a frame into a plurality of subbands having different frequency components;

first extraction means for classifying the plurality of subbands into a first group and a second
25 group and extracting, as motion compensation target data, data of a predetermined number of upper bits of frequency component coefficient data forming subbands

belonging to the first group;

second extraction means for extracting data of a predetermined number of lower bits of each of frequency component coefficient data forming subbands belonging
5 to the first group;

motion compensation means for generating motion vector information and predicted value information on the basis of motion compensation target data of a current frame extracted by the first extraction means
10 and decoded data corresponding to motion compensation target data obtained when a preceding frame is coded;

first coding means for obtaining a difference value between predicted value information generated by the motion compensation means and motion compensation
15 target data of the current frame and coding the difference value and the motion vector information;

second coding means for coding, as non-motion compensation target data, data of a predetermined number of lower bits of each frequency component
20 coefficient data extracted by the second extraction means and frequency component coefficient data of subbands belonging to the second group; and

multiplexing means for multiplexing the code data obtained by the first coding means and the second
25 coding means.

7. A computer-readable storage medium characterized by storing a computer program defined in claim 6.

8. A moving image decoding apparatus which decodes moving image data coded by a moving image coding apparatus defined in any one of claims 1 to 4, characterized by comprising:

5 separation means for separating code data of an input frame into first code data and second code data respectively corresponding to the first group and the second group;

first decoding means for generating decoded data
10 of the upper bits of a subband belonging to the first group of a current frame on the basis of a difference value and motion vector information with respect to the predetermined upper bits of the subband belonging to the first group of the current frame obtained by
15 decoding the separated first code data and decoded data of the predetermined upper bits corresponding to the first group of a preceding frame;

second decoding means for decoding the second code data;

20 generation means for generating decoded data corresponding to the first group of the current frame by combining decoded data of lower bits of the first group obtained by said second decoding means and decoded data of upper bits obtained by said first
25 decoding means; and

reconstruction means for reconstructing an image of the current frame by performing processing inverse

to said decomposition means on the basis of the decoded data of the subband belonging to the first group which is generated by said generation means, and the decoded data of the subband belonging to the second group which is obtained by said second decoding means.

9. The apparatus according to claim 8, characterized by further comprising, when a moving image decoding apparatus defined in claim 8 decodes moving image data coded by a moving image coding apparatus defined in claim 3,

setting means for setting a predetermined number of code data of bitplanes, of the second code data, which ranges from a lower bitplane to an upper bitplane, as data other than data to be decoded.

10. The apparatus according to claim 9, characterized in that said setting means measures a time required to reconstruct one preceding frame, and sets the number of bitplanes as bitplanes other than bitplanes to be decoded for each subband on the basis of the measured time value.

11. A control method for a moving image decoding apparatus which decodes moving image data coded by a moving image coding apparatus defined in any one of claims 1 to 4, characterized by comprising:

a separation step of separating code data of an input frame into first code data and second code data respectively corresponding to the first group and the

second group;

5 a first decoding step of generating decoded data of the upper bits of a subband belonging to the first group of a current frame on the basis of a difference value and motion vector information with respect to the predetermined upper bits of the subband belonging to the first group of the current frame obtained by decoding the separated first code data and decoded data of the predetermined upper bits corresponding to the first group of a preceding frame;

a second decoding step of decoding the second code data;

15 a generation step of generating decoded data corresponding to the first group of the current frame by combining decoded data of lower bits of the first group obtained in the second decoding step and decoded data of upper bits obtained in the first decoding step; and

20 a reconstruction step of reconstructing an image of the current frame by performing processing inverse to the decomposition step on the basis of the decoded data of the subband belonging to the first group which is generated in the generation step, and the decoded data of the subband belonging to the second group which is obtained in the second decoding step.

12. A computer program which is read and executed by a computer to function as a moving image decoding

apparatus which decodes moving image data coded by a moving image coding apparatus defined in any one of claims 1 to 4, characterized in that the computer program functions as:

5 separation means for separating code data of an input frame into first code data and second code data respectively corresponding to the first group and the second group;

 first decoding means for generating decoded data
10 of the upper bits of a subband belonging to the first group of a current frame on the basis of a difference value and motion vector information with respect to the predetermined upper bits of the subband belonging to the first group of the current frame obtained by
15 decoding the separated first code data and decoded data of the predetermined upper bits corresponding to the first group of a preceding frame;

 second decoding means for decoding the second code data;

20 generation means for generating decoded data corresponding to the first group of the current frame by combining decoded data of lower bits of the first group obtained by the second decoding means and decoded data of upper bits obtained by the first decoding
25 means; and

 reconstruction means for reconstructing an image of the current frame by performing processing inverse

to the decomposition means on the basis of the decoded data of the subband belonging to the first group which is generated by the generation means, and the decoded data of the subband belonging to the second group which is obtained by the second decoding means.

13. A computer-readable storage medium characterized by storing a computer program defined in claim 12.

14. A moving image coding apparatus which codes time-series frames constituting moving image data, characterized by comprising:

decomposition means for decomposing a frame into a plurality of subbands having different frequency components;

first extraction means for extracting data of a predetermined number of upper bits of frequency component coefficient data constituting each subband as motion compensation target data;

second extraction means for extracting data of a predetermined number of lower bits of the frequency component coefficient data constituting each subband as non-motion compensation target data;

motion compensation means for generating motion vector information and predicted value information on the basis of motion compensation target data of a current frame extracted by said first extraction means and decoded data corresponding to motion compensation target data obtained when a preceding frame is coded;

first coding means for obtaining a difference value between predicted value information generated by said motion compensation means and motion compensation target data of the current frame and coding the
5 difference value and the motion vector information;

second coding means for coding data of a predetermined number of lower bits of each frequency component coefficient data extracted by said second extraction means; and

10 multiplexing means for multiplexing the code data obtained by said first coding means and said second coding means.

15. The apparatus according to claim 14, characterized in that said decomposition means
15 comprises means for decomposing a frame into a plurality of subbands on the basis of a discrete wavelet transformation method.

16. The apparatus according to claim 14 or 15, characterized in that said second coding means performs
20 coding for each bitplane at each bit position which represents frequency component data or for each sub-bitplane.

17. The apparatus according to claim 16, characterized in that said second coding means includes
25 selection means for selecting bits in order of a least significant bit to an upper bit as bitplanes serving as non-coding targets, on the basis of a generated code

amount, and codes bitplanes other than the bitplanes selected by the selection means.

18. A control method for a moving image coding apparatus which codes time-series frames constituting moving image data, characterized by comprising:

a decomposition step of decomposing a frame into a plurality of subbands having different frequency components;

a first extraction step of extracting data of a predetermined number of upper bits of frequency component coefficient data constituting each subband as motion compensation target data;

a second extraction step of extracting data of a predetermined number of lower bits of the frequency component coefficient data constituting each subband as non-motion compensation target data;

a motion compensation step of generating motion vector information and predicted value information on the basis of motion compensation target data of a current frame extracted in the first extraction step and decoded data corresponding to motion compensation target data obtained when a preceding frame is coded;

a first coding step of obtaining a difference value between predicted value information generated in the motion compensation step and motion compensation target data of the current frame and coding the difference value and the motion vector information;

a second coding step of coding data of a predetermined number of lower bits of each frequency component coefficient data extracted in the second extraction step; and

5 a multiplexing step of multiplexing the code data obtained in the first coding step and the second coding means.

19. A computer program which is read and executed by a computer to function as a moving image coding
10 apparatus which codes time-series frames constituting moving image data, characterized in that the computer program functions as:

decomposition means for decomposing a frame into a plurality of subbands having different frequency
15 components;

first extraction means for extracting data of a predetermined number of upper bits of frequency component coefficient data constituting each subband as motion compensation target data;

20 second extraction means for extracting data of a predetermined number of lower bits of the frequency component coefficient data constituting each subband as non-motion compensation target data;

motion compensation means for generating motion
25 vector information and predicted value information on the basis of motion compensation target data of a current frame extracted by the first extraction means

and decoded data corresponding to motion compensation target data obtained when a preceding frame is coded;

first coding means for obtaining a difference value between predicted value information generated by the motion compensation means and motion compensation target data of the current frame and coding the difference value and the motion vector information;

second coding means for coding data of a predetermined number of lower bits of each frequency component coefficient data extracted by the second extraction means; and

multiplexing means for multiplexing the code data obtained by the first coding means and the second coding means.

20. A computer-readable storage medium characterized by storing a computer program defined in claim 19.

21. A moving image decoding apparatus which decodes moving image data coded by a moving image coding apparatus defined in any one of claims 14 to 17, characterized by comprising:

separation means for separating code data of an input frame into first code data corresponding to motion compensation target data and second code data corresponding to non-motion compensation target data;

first decoding means for generating decoded data of upper bits of each subband in a current frame on the basis of a difference value and motion vector

information with respect to the predetermined upper bits of each subband in the current frame obtained by decoding the separated first code data and decoded data of motion compensation data in a preceding frame;

5 second decoding means for decoding the second code data;

 generation means for generating frequency component data of each subband in the current frame by combining the decoded data of the lower bits of each subband obtained by said second decoding means and the
10 decoded data of the upper bits of each subband obtained by said first decoding means; and

 reconstruction means for reconstructing an image of the current frame by performing processing inverse
15 to said decomposition means with respect to the frequency component data of the subband generated by said generation means.

22. The apparatus according to claim 21, characterized by further comprising, when a moving
20 image decoding apparatus defined in claim 21 decodes moving image data coded by a moving image coding apparatus defined in claim 16,

 setting means for setting a predetermined number of code data of bitplanes, of the second code data,
25 which ranges from a lower bitplane to an upper bitplane, as data other than data to be decoded.

23. The apparatus according to claim 22,

characterized in that said setting means increases the number of bitplanes which are not to be decoded with respect to a subband in which frequency components gradually decrease in frequency, when a time required to reconstruct one preceding frame is measured, and a value of the measured time is larger than a first threshold, and decreases the number of bitplanes which are not to be decoded with respect to a subband in which frequency components gradually increase in frequency, when the value of the measured time is smaller than a second threshold.

24. A control method for a moving image decoding apparatus which decodes moving image data coded by a moving image coding apparatus defined in any one of claims 14 to 17, characterized by comprising:

a separation step of separating code data of an input frame into first code data corresponding to motion compensation target data and second code data corresponding to non-motion compensation target data;

a first decoding step of generating decoded data of upper bits of each subband in a current frame on the basis of a difference value and motion vector information with respect to the predetermined upper bits of each subband in the current frame obtained by decoding the separated first code data and decoded data of motion compensation data in a preceding frame;

a second decoding step of decoding the second

code data;

a generation step of generating frequency component data of each subband in the current frame by combining the decoded data of the lower bits of each subband obtained in the second decoding step and the
5 decoded data of the upper bits of each subband obtained in the first decoding step; and

a reconstruction step of reconstructing an image of the current frame by performing processing inverse
10 to the decomposition step with respect to the frequency component data of the subband generated in the generation step.

25. A computer program which is read and executed by a computer to function as a moving image decoding
15 apparatus which decodes moving image data coded by a moving image coding apparatus defined in any one of claims 14 to 17, characterized in that the computer program functions as:

separation means for separating code data of an
20 input frame into first code data corresponding to motion compensation target data and second code data corresponding to non-motion compensation target data;

first decoding means for generating decoded data of upper bits of each subband in a current frame on the
25 basis of a difference value and motion vector information with respect to the predetermined upper bits of each subband in the current frame obtained by

decoding the separated first code data and decoded data of motion compensation data in a preceding frame;

second decoding means for decoding the second code data;

5 generation means for generating frequency component data of each subband in the current frame by combining the decoded data of the lower bits of each subband obtained by the second decoding means and the decoded data of the upper bits of each subband obtained
10 by the first decoding means; and

reconstruction means for reconstructing an image of the current frame by performing processing inverse to the decomposition means with respect to the frequency component data of the subband generated by
15 the generation means.

26. A computer-readable storage medium characterized by storing a computer program defined in claim 25.

27. A moving image coding apparatus which codes time-series frames constituting moving image data,
20 characterized by comprising:

discrete wavelet transformation means for obtaining information of a plurality of subbands by performing discrete wavelet transformation for a frame;

inter-frame coding means for performing motion
25 compensation coding for a first group comprising subbands of low-frequency components from said discrete wavelet transformation means on the basis of decoded

data of each subband included in the first group when a preceding frame is coded;

intra-frame coding means for performing coding within a current frame with respect to a second group
5 comprising subbands of high-frequency components higher in frequency than the low-frequency components; and

multiplexing means for multiplexing code data coded by said inter-frame coding means and said intra-frame coding means.

10 28. A moving image coding method of coding time-series frames constituting moving image data, characterized by comprising:

a discrete wavelet transformation step of obtaining information of a plurality of subbands by
15 performing discrete wavelet transformation for a frame;

an inter-frame coding step of performing motion compensation coding for a first group comprising subbands of low-frequency components from the discrete wavelet transformation step on the basis of decoded
20 data of each subband included in the first group when a preceding frame is coded;

an intra-frame coding step of performing coding within a current frame with respect to a second group comprising subbands of high-frequency components higher
25 in frequency than the low-frequency components; and

a multiplexing step of multiplexing code data coded in the inter-frame coding step and the

intra-frame coding means.

29. A moving image decoding apparatus which decodes code data obtained by a moving image coding method defined in claim 28, characterized by comprising:

5 separation means for separating input code data into inter-frame code data and intra-frame code data;
 inter-frame decoding means for generating data of a subband of a low-frequency component by decoding the separated inter-frame code data with motion
10 compensation;

 intra-frame decoding means for generating data of a subband of a frequency component higher in frequency than the low-frequency component by intra-frame-coding the separated intra-frame code data; and

15 reconstruction means for reconstructing an image of a current frame by performing inverse discrete wavelet transformation for the data of the subbands obtained by said inter-frame decoding means and said intra-frame decoding means.

20 30. A moving image decoding method of decoding code data obtained by a moving image coding method defined in claim 28, characterized by comprising:

 a separation step of separating input code data into inter-frame code data and intra-frame code data;

25 an inter-frame decoding step of generating data of a subband of a low-frequency component by decoding the separated inter-frame code data with motion

compensation;

an intra-frame decoding step of generating data
of a subband of a frequency component higher in
frequency than the low-frequency component by
5 intra-frame-coding the separated intra-frame code data;
and

a reconstruction step of reconstructing an image
of a current frame by performing inverse discrete
wavelet transformation for the data of the subbands
10 obtained in the inter-frame decoding step and the
intra-frame decoding step.

31. A moving image coding apparatus which codes
time-series frames constituting moving image data,
characterized by comprising:

15 decomposition means for decomposing a frame into
a plurality of subbands having different frequency
components;

first extraction means for, with a threshold set
for each subband being represented by TB, extracting
20 data of upper bits as motion compensation target data
which excludes lower TB bits of frequency component
coefficient data constituting each subband;

second extraction means for extracting data of
lower TB bits of the frequency component coefficient
25 data constituting each subband as non-motion
compensation target data;

motion compensation means for generating motion

vector information and predicted value information on the basis of motion compensation target data of a current frame extracted by said first extraction means and decoded data corresponding to the motion

5 compensation target data obtained when a preceding frame is coded;

first coding means for obtaining a difference value between predicted value information generated by said motion compensation means and the motion

10 compensation target data in the current frame and coding the difference value and the motion vector information;

second coding means for coding data of the lower TB bits of each frequency component coefficient data

15 extracted by said second extraction means; and

multiplexing means for multiplexing code data obtained by said first coding means and said second coding means.

32. The apparatus according to claim 31,

20 characterized in that said decomposition means comprises means for decomposing a frame into a plurality of subbands on the basis of a discrete wavelet transformation method.

33. The apparatus according to claim 31 or 32,

25 characterized in that said second coding means performs coding for each bitplane at each bit position which represents frequency component data or for each

sub-bitplane.

34. The apparatus according to claim 33,
characterized in that said second coding means includes
selection means for selecting bits from a least
5 significant bit to an upper bit as bitplanes serving as
non-coding targets, on the basis of a generated code
amount, and codes bitplanes other than the bitplanes
selected by the selection means.

35. The apparatus according to any one of claims 31
10 to 34, characterized in that the threshold TB set for
each subband is 0 for subbands of low-frequency
components.

36. A control method for a moving image coding
apparatus which codes time-series frames constituting
15 moving image data, characterized by comprising:

a decomposition step of decomposing a frame into
a plurality of subbands having different frequency
components;

a first extraction step of, with a threshold set
20 for each subband being represented by TB, extracting
data of upper bits as motion compensation target data
which excludes lower TB bits of frequency component
coefficient data constituting each subband;

a second extraction step of extracting data of
25 lower TB bits of the frequency component coefficient
data constituting each subband as non-motion
compensation target data;

motion compensation means for generating motion vector information and predicted value information on the basis of motion compensation target data of a current frame extracted in the first extraction step
5 and decoded data corresponding to the motion compensation target data obtained when a preceding frame is coded;

a first coding step of obtaining a difference value between predicted value information generated in
10 the motion compensation step and the motion compensation target data in the current frame and coding the difference value and the motion vector information;

a second coding step of coding data of the lower
15 TB bits of each frequency component coefficient data extracted in the second extraction step; and

a multiplexing step of multiplexing code data obtained in the first coding step and the second coding step.

20 37. A computer program which is read and executed by a computer to function as a moving image coding apparatus which codes time-series frames constituting moving image data, characterized in that the computer program functions as:

25 decomposition means for decomposing a frame into a plurality of subbands having different frequency components;

first extraction means for, with a threshold set for each subband being represented by TB, extracting data of upper bits as motion compensation target data which excludes lower TB bits of frequency component coefficient data constituting each subband;

second extraction means for extracting data of lower TB bits of the frequency component coefficient data constituting each subband as non-motion compensation target data;

motion compensation means for generating motion vector information and predicted value information on the basis of motion compensation target data of a current frame extracted by the first extraction means and decoded data corresponding to the motion compensation target data obtained when a preceding frame is coded;

first coding means for obtaining a difference value between predicted value information generated by the motion compensation means and the motion compensation target data in the current frame and coding the difference value and the motion vector information;

second coding means for coding data of the lower TB bits of each frequency component coefficient data extracted by the second extraction means; and

multiplexing means for multiplexing code data obtained by the first coding means and the second

coding means.

38. A computer-readable storage medium characterized by storing a computer program defined in claim 37.

39. A moving image decoding apparatus which decodes
5 moving image data coded by a moving image coding apparatus defined in any one of claims 31 to 35, characterized by comprising:

separation means for separating code data of an input frame into first code data corresponding to
10 motion compensation target data and second code data corresponding to non-motion compensation target data;

first decoding means for generating decoded data of upper bits of each subband in a current frame on the basis of a difference value and motion vector
15 information with respect to data of the upper bits of each subband in the current frame obtained by decoding the separated first code data and decoded data of motion compensation data in a preceding frame;

second decoding means for decoding the second
20 code data;

generation means for generating frequency component data of each subband in the current frame by combining the decoded data of the lower bits of each subband obtained by said second decoding means and the
25 decoded data of the upper bits of each subband obtained by said first decoding means; and

reconstruction means for reconstructing an image

of the current frame by performing processing inverse to said decomposition means for the frequency component data of the subband generated by said generation means.

40. The apparatus according to claim 39,

5 characterized by further comprising, when a moving image decoding apparatus defined in claim 39 decodes moving image data coded by a moving image coding apparatus defined in claim 33,

setting means for setting a predetermined number
10 of code data of bitplanes, of the second code data, which ranges from a lower bitplane to an upper bitplane, as data other than data to be decoded.

41. The apparatus according to claim 40,

characterized in that said setting means increases the
15 number of bitplanes which are not to be decoded with respect to a subband in which frequency components gradually decrease in frequency, when a time required to reconstruct one preceding frame is measured, and a value of the measured time is larger than a first
20 threshold, and decreases the number of bitplanes which are not to be decoded with respect to a subband in which frequency components gradually increase in frequency, when the value of the measured time is smaller than a second threshold.

25 42. A control method for a moving image decoding apparatus which decodes moving image data coded by a moving image coding apparatus defined in any one of

claims 31 to 35, characterized by comprising:

a separation step of separating code data of an input frame into first code data corresponding to motion compensation target data and second code data
5 corresponding to non-motion compensation target data;

a first decoding step of generating decoded data of upper bits of each subband in a current frame on the basis of a difference value and motion vector information with respect to data of the upper bits of
10 each subband in the current frame obtained by decoding the separated first code data and decoded data of motion compensation data in a preceding frame;

a second decoding step of decoding the second code data;

15 a generation step of generating frequency component data of each subband in the current frame by combining the decoded data of the lower bits of each subband obtained in the second decoding step and the decoded data of the upper bits of each subband obtained
20 in the first decoding step; and

a reconstruction step of reconstructing an image of the current frame by performing processing inverse to the decomposition step for the frequency component data of the subband generated in the generation step.

25 43. A computer program which is read and executed by a computer to function as a moving image decoding apparatus which decodes moving image data coded by a

moving image coding apparatus defined in any one of claims 31 to 35, characterized in that the computer program functions as:

separation means for separating code data of an input frame into first code data corresponding to motion compensation target data and second code data corresponding to non-motion compensation target data;

first decoding means for generating decoded data of upper bits of each subband in a current frame on the basis of a difference value and motion vector information with respect to data of the upper bits of each subband in the current frame obtained by decoding the separated first code data and decoded data of motion compensation data in a preceding frame;

second decoding means for decoding the second code data;

generation means for generating frequency component data of each subband in the current frame by combining the decoded data of the lower bits of each subband obtained by the second decoding means and the decoded data of the upper bits of each subband obtained by the first decoding means; and

reconstruction means for reconstructing an image of the current frame by performing processing inverse to the decomposition means for the frequency component data of the subband generated by the generation means.

44. A computer-readable storage medium characterized

by storing a computer program defined in claim 43.